



Volume XIX Issue 1 - 2003

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# SURVIAC Bulletin

## Survivability/Vulnerability Information Analysis Center

SURVIAC is a U.S. Department of Defense Information Analysis Center (IAC) sponsored by the Defense Information Systems Agency (DISA), Defense Technical Information Center (DTIC).

### AFRL Releases Audit Trail Viewer (ATV)

*By Mr. Alex Sarnacki, Air Force Research Laboratory (AFRL/IFSB)*

The Air Force Research Laboratory's (AFRL) Information Directorate has officially released the Audit Trail Viewer (ATV). The ATV was created as a replacement for IVIEW 2000 and was initially developed to support the display of air engagement simulations at the National Air Intelligence Center at Wright-Patterson AFB, OH. Written in Java, the ATV is cross platform capable and will operate in both the Windows and Unix Operating Systems. Support for the Macintosh platform will be available in the near future. The ATV allows visualization, playback, and analysis of a variety of recorded simulation file types.

The current release of the ATV allows for the visualization of recorded simulation audit trails from the following list of simulation file formats; BlueMax, IView 2000 ASCII, IView-style Suppressor, IView-style Brawler, JMASS (partially implemented), JWARS, MIL-AASPEM 2.0, SimView, Trap 3.1, and UCAVSIM. The ATV supports the 3D representation of the simulation entities as either Wavefront.obj models or .gif files with newer formats coming shortly, such as Microsoft's flight simulator MDL, Open Flight FLT, and VRML.

*ATV continued on page 6*



In this view, captured from the Audit Trail Viewer, the analyst obtained a close up view of the detailed aircraft model using the Orbit View, enabled the SkyBox, enabled fictional terrain, displayed affiliation sensitive past and future trails, and enabled the bottom and one side of the bounded grid.

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Inquiries about SURVIAC's capabilities, products and services, or comments regarding this publication may be addressed to:

46 OG/OGM/OL-AC/SURVIAC

2700 D St., Building 1661

Wright-Patterson AFB, Ohio 45433-7605

Com: (937) 255-4840, DSN: 785-4840

Fax: (937) 255-9673

E-mail: [surviac@bah.com](mailto:surviac@bah.com) URL: <http://iac.dtic.mil/surviac>

## **SURVIAC Points of Contact**

**Com: (937) 255-4840**

**DSN: 785-4840**

**Fax: (937) 255-9673**

### **Kevin Crosthwaite**

**SURVIAC Director (ext. 279)**

**E-mail: [crosthwaite\\_kevin@bah.com](mailto:crosthwaite_kevin@bah.com)**

### **Donna Egner**

**SURVIAC Deputy Director (ext. 282)**

**E-mail: [degner@bah.com](mailto:degner@bah.com)**

### **Gerald Bennett**

**Survivability Analyst (ext. 281)**

**E-mail: [gbennett@bah.com](mailto:gbennett@bah.com)**

### **Barry Vincent**

**Model Manager (ext. 273)**

**E-mail: [vincent\\_barry@bah.com](mailto:vincent_barry@bah.com)**

### **Mike Bennett**

**Model Manager**

**Com: (937) 431-2707**

**E-mail: [bennett\\_michael@bah.com](mailto:bennett_michael@bah.com)**

### **Paul Jeng**

**Model Manager (ext. 273)**

**E-mail: [surviacmodels@bah.com](mailto:surviacmodels@bah.com)**

### **Jim Davis**

**Researcher (ext. 278)**

**E-mail: [davis\\_james@bah.com](mailto:davis_james@bah.com)**

### **Geri Bowling**

**Model Administrator (ext. 285)**

**E-mail: [gbowling@bah.com](mailto:gbowling@bah.com)**

### **A.J. Brown**

**Security Specialist (ext. 211)**

**E-mail: [brown\\_alvin@bah.com](mailto:brown_alvin@bah.com)**

### **Leslie Shipp**

**Research Assistant (ext. 274)**

**E-mail: [shipp\\_leslie@bah.com](mailto:shipp_leslie@bah.com)**

### **Linda Ryan**

**SURVIAC Bulletin (ext. 208)**

**E-mail: [liryan@bah.com](mailto:liryan@bah.com)**

**Visit our web site !**

**<http://iac.dtic.mil/surviac>**

# NDIA Presents Annual Survivability Awards



Pictured Left to Right:  
D. Jerry Wallick, Chmn.  
Awards Cmte., NDIA CSD  
Dr. Steven L. Messervy  
Mr. Paul W. Martin  
Mr. John J. Welch, Jr  
RADM Robert H. Gormley,  
USN (Ret.), Chmn. NDIA CSD

The National Defense Industrial Association's (NDIA) Combat Survivability Awards for Leadership and Technical Achievement were presented to Dr. Steven L. Messervy and Mr. Paul W. Martin, respectively, at the Aircraft Survivability 2002 Symposium held 18-21 November 2002 at the Naval Postgraduate School (NPS), Monterey, California. In addition to these annual awards, the NDIA Combat Survivability Award for Lifetime Achievement was presented to Mr. John J. (Jack) Welch, Jr.

Messervy's demonstrated exceptional leadership in a key technical field, the combat survivability of Army aircraft has been significantly enhanced and the Army better positioned than before to prevail in any future conflict.

In addition to Dr. Messervy's Army job, he also serves as the Army principle member for the JASPO. Over the last three years he has led that key survivability agency as its chairman.

## Combat Survivability Award for Leadership 2002



Dr. Steven L. Messervy

The NDIA Combat Survivability Award for Leadership is presented to a person who has made major contributions to enhancing combat survivability. The emphasis of this award is on demonstrated superior leadership of a continuing nature.

Dr. Messervy, US Army Assistant Program Executive Officer (PEO), Aviation and former Project Manager, Aviation Electronic Systems, Army Program Executive Office, Aviation, Redstone Arsenal, Alabama was the 2002 Leadership Award recipient. As Project Manager, Aviation Electronic Systems, he was directly responsible for planning, developing, and fielding all U.S. Army aircraft survivability equipment (ASE). As an effective advocate for aircraft survivability programs, Dr. Messervy tirelessly pushed for increased awareness and funding for all areas of electronic warfare, and he garnered industry, congressional and internal Army support for critical ASE systems. Because of Dr.

## Combat Survivability Award for Technical Achievement 2002



Mr. Paul W. Martin

The NDIA Combat Survivability Award for Technical Achievement is presented to a person or team who has made a significant technical contribution to any aspect of survivability. It may be presented for a specific act or contribution or for exceptional technical performance over a prolonged period.

Mr. Paul W. Martin, Senior Vice President, Government and Advanced Programs, Sikorsky Aircraft Corporation, Stratford, Connecticut, was the 2002 Technical Achievement Award recipient. Throughout his career as an engineer and technical manager, Mr. Martin has been instrumental in the development and fielding of survivable military aircraft. In particular, he is credited with integrating stealth technology into the systems engineering discipline, ensuring that this revolutionary new technology

*Survivability Awards continued on page 4*

was incorporated into the design of a front line weapon system, the F-117 stealth fighter, and not merely allowed to languish as an interesting technological curiosity. He has been instrumental in the transition of several generations of survivability enhancement technologies to meet threats of increasing sophistication, providing critical technical guidance for developments of the F-15, SR-71, F-117, F/A-22, UH-1N, CH-53 and RAH-66, as well as unmanned aerial vehicles. Because of Mr. Martin's personal contributions to enhancing the combat survivability of numerous aircraft and related systems over the years, the United States is today well positioned to prevail in any future conflict.

### **NDIA Combat Survivability Award for Lifetime Achievement 2002**



The National Defense Industrial Association's Combat Survivability Award for Lifetime Achievement is presented only when merited by the lifetime contributions of a noteworthy individual to the long-term enhancement of aircraft survivability and national security. The Combat Survivability Lifetime Achievement Award

was presented to Mr. John J. Welch, Jr., Consultant, Bethesda, Maryland.

During a lifetime of service to the United States in senior executive positions of great trust and responsibility, Mr. Welch shepherded the development and fielding of effective air weapon systems that have proven their worth during combat operations. As Chief Scientist of the Air Force, and later as Assistant Secretary (Acquisition), he provided critical technical guidance and acquisition oversight for the U.S. Air Force, thereby ensuring the successful introduction of such systems as the Advanced Cruise Missile, F/A-22, B-2 and F-117. Importantly, he was influential in convincing others of the military worth of stealth technology as an effective survivability enhancement technique. Because of Mr. Welch's personal contributions to enhancing the combat survivability of a wide range of aircraft and related systems over the years, the United States is today well positioned to prevail in any future conflict.

The Combat Survivability Awards are presented each year at the NDIA Aircraft Survivability Symposium. The next symposium will be held on 3-6 November 2003. For more information on nominating someone for the Combat Survivability Award for Leadership, Combat Survivability Award for Technical Achievement or the Combat Survivability Award for Lifetime Achievement, please contact Joe Hylan, (703) 247-2583, NDIA, Roland Marquis, (847) 259-9600 x4548, NDIA CSD Award Committee Chair, or visit the NDIA website at <http://www.ndia.org>.



## New Sponsor for the Ground Vehicle Survivability Symposium



**Dr. Grace Bochenek**

TACOM, the US Army's Tank-automotive and Armaments Command, announced the promotion of Dr. Grace M. Bochenek, as Executive Director, Research, TARDEC. In her new position, Bochenek will serve as Technology Director for the Command. She will be responsible for aligning all of its science and technology research objectives to meet the future needs of the Army.

Dr. Bochenek has more than 15 years of technical and managerial experience in the areas of simulation, virtual reality, system

design and acquisition, virtual prototyping, research, development, engineering, program management and joint international programs. Based on her research and its impact on the Army, she is recognized throughout military and international research communities as an expert in 3-D visualization, immersive virtual environments, real-time simulation and integrating high-end graphics into product design processes.

Her work in immersive virtual reality technology and Advanced Collaborative Environments (ACE) has brought recognition to her team, TARDEC, and the entire U.S. Army. She has made a major impact on the Army modeling and simulation community and is a strong spokesperson for the importance of applying those technologies to Army business processes. "I am looking forward to bringing the technologies at TACOM into systems, like Future Combat Systems," said Bochenek. "Keeping our customer in mind, the soldier, and building what they need will help bridge the gap between system and requirements."

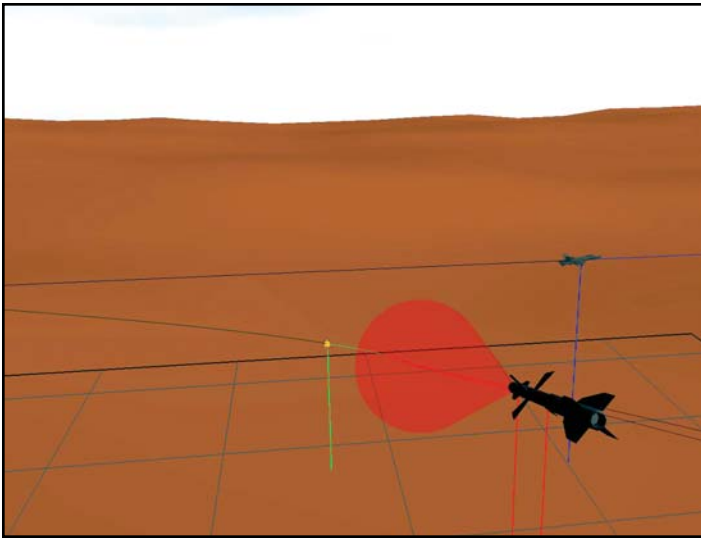
One of her first roles as Executive Director, Research, TARDEC, Bochenek will be to sponsor the 14th Annual Ground Vehicle Survivability Symposium at the Naval Postgraduate School in Monterey, California, 7-10 April 2003. The Symposium is held annually to provide a forum for the discussion, interchange and debate of accomplishments, discoveries and issues in all ground vehicle survivability technology areas. The conference is significant because of its relevance to the Objective Force Task Force's charter from the Chief of Staff of the Army. The Symposium will provide a setting for the discussion of the implications of this technology on the Objective Force and the Future Combat System. "The symposium is a unique opportunity bringing government and industry together to interchange information," said Bochenek. "I am excited at getting a first hand look at the new technologies in the various communities."

### **14th Annual Ground Vehicle Survivability Symposium**

The 14th Annual Ground Vehicle Survivability Symposium will be held 7-10 April 2003 at the Naval Postgraduate School, Monterey, California. The symposium is being held under the auspices and sponsorship of the Survivability Technology Area, US Army Tank-automotive and Armaments Command Research, Development and Engineering Center (TARDEC). The conference will be classified up to and including SECRET US ONLY.

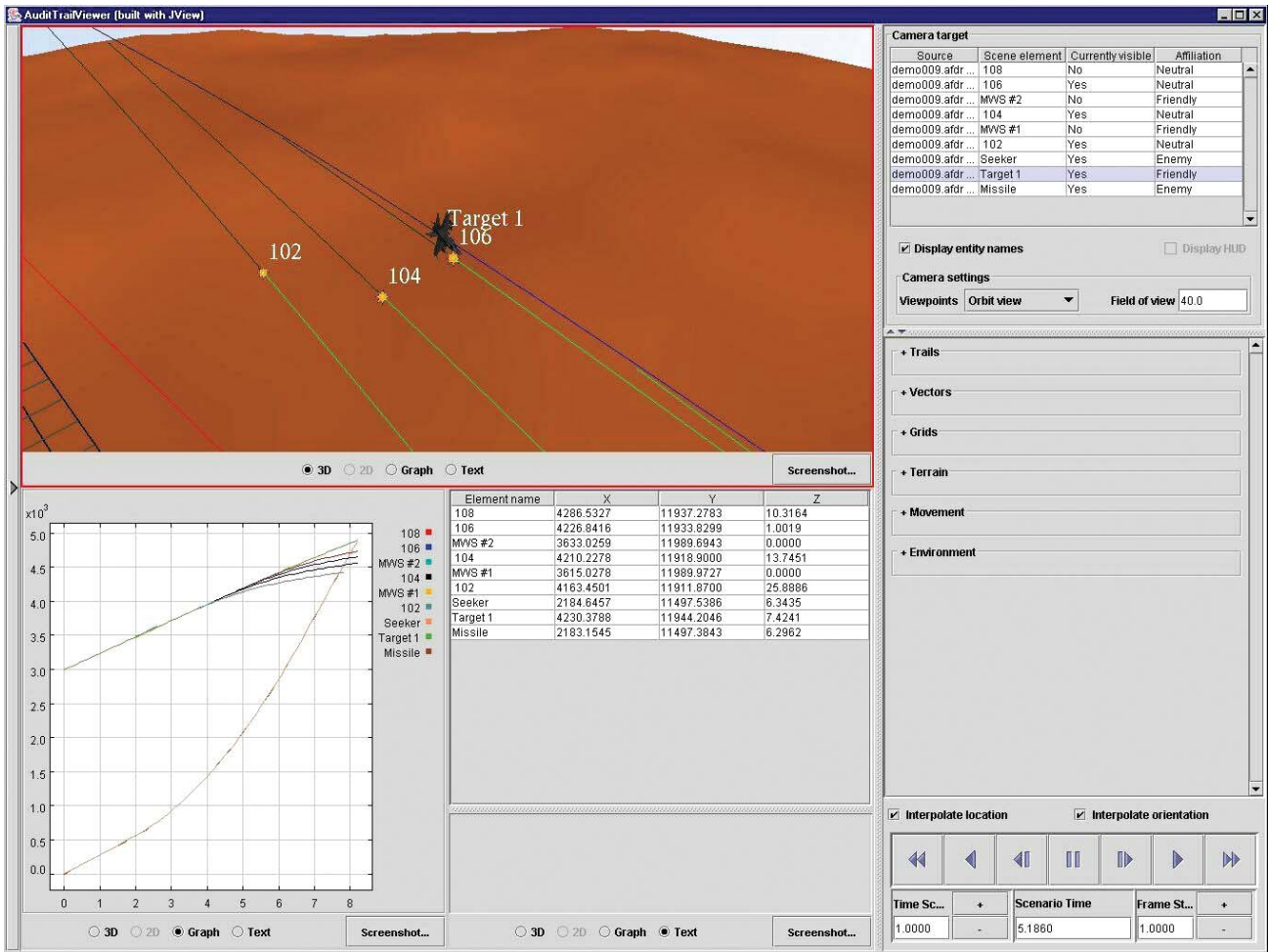
The GVSS has been held annually to provide a forum for the discussion, interchange and debate of accomplishments, discoveries and issues in all ground vehicle survivability technology areas. The conference is significant because of its relevance to the Objective Force Task Force's charter from the Chief of Staff of the Army. The symposium will provide a setting for the discussion of the implications of Survivability Technology focusing primarily on the Objective Force and the Future Combat System. Discussion on the Legacy Fleet are also Actively solicited.

*Further information on this conference, please contact Lisa Lynch, at Booz Allen Hamilton at (586) 987-3108.*



This is a view from the screen capture functionality of the Audit Trail Viewer. In this example the analyst is displaying a configurable sensor cone representing the seeker of the missile with affiliation sensitive trails. A bottom bounded grid is also being displayed with associated element projections, allowing the user to better understand the entitie's location in the 3D scene.

The ATV was built using the JView Application Programmers Interface (API) that was also developed at AFRL. JView is a 3D runtime configurable and platform independent visualization API upon which robust applications can be built. It is written entirely in Java and utilizes the GL4Java API to gain 3D hardware graphics acceleration. It has been developed using concrete Object Oriented Design and Programming techniques to provide a robust and venue non-specific visualization environment. It has been designed to let the software developer take advantage of 3D graphics without having extensive knowledge of such graphics. Using JView may dramatically reduce development time of new applications. JView provides a variety of pre-built components that the developer can take advantage of, such as, DTED loaders, user interface device drivers, model loaders, geometric shapes, artificial environments, a complete 3D graphics engine, and many other tools.



This figure shows the Audit Trail Viewer displaying an IView compatible simulation run from the Trajectory Analysis Program. In this view the analyst has a 3D Orbiting View, a 2D Graph of the simulation's X-axis versus Time, and the location of the entities in the scene. The F-18 model was assigned from the Model Assignment panel and the simple flare.gif image was used for the countermeasures. The control panel on the right is displayed for the current active view, as specified by the red border.

The ATV's suite of built-in support tools complement the 3D visualization of the simulation result. It gives the user the ability for multiple, simultaneous views, consisting of 3D, text data, and/or graphs. All views update simultaneously in real time during the playback of the simulation audit trail. It also has the ability to do 2D graphing and plotting of any of the following variables; time, location, orientation, component velocity, and mach. Other features include displaying of configurable bounding grids and element projections to those grids, affiliation sensitive coloring for trails and element projections, several simulated terrain types and Skybox environments to help the user maintain perspective, file based configuration for all 3D settings allowing settings to be saved and then loaded up each time you start the application, configurable geometry cones to simulate coverage areas, vectors, configurable screen layouts, and built in screen capture support.

User interaction with the 3D environment can be performed using the keyboard, mouse, and, optionally, Logitech's Magellan 3D input device. The ATV has three different camera positioning tools. The Observer View is a free flight mode which allows the user to position themselves at any point in space, the Trail

Behind mode follows a chosen entity, and the Orbit View which follows the selected entity and allows the viewer to orbit around it to any desired look-angle.

The current version of the Audit Trail Viewer is being supported at the same time as new features are being developed. Such features include the ability to handle new data input formats, generate movies (mpegs), and the loading of the National Imagery and Mapping Agency's (NIMA) products such as Digital Terrain Elevation Data (DTED).

The Audit Trail Viewer and the JView API are government-owned and available free of charge to government agencies and their contractors. Formal configuration management and distribution of JView is performed through the AFRL/IF Information Management Services program. The ATV is currently being distributed on the same CD as the JView API. One can request a copy by visiting:

<https://extranet.if.af.mil/jview/>. For more information contact the JView program office at the Air Force Research Laboratory's Information Directorate by calling (315) 330-3898 or email [jview@rl.af.mil](mailto:jview@rl.af.mil).

## Encore, Encore!

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On 9 January 2003 Booz Allen Hamilton and their team of SURVICE Engineering, Battelle, and new teammates EXCEL Management Systems, Inc., Veridian, IIT Industries, AttoTek Inc., Stellar Solutions, and Mt. Vernon-Lee Enterprises Inc. was awarded the new SURVIAC contract. The contract extends for three years, with options up to ten years, extending the contract to 2013.

The Joint Aircraft Survivability Program Office (JASPO) and the Joint Technical Coordinating Group for Munitions Effectiveness (JTCG/ME) will continue as Joint Service Sponsors and will monitor SURVIAC activities. Overall IAC program management responsibility remains with the Defense Technical Information Center (DTIC), Mr. Ron Hale. Mr. Martin Lentz, 46 OG/OGM/OL-AC, will continue as the Contracting Officer's Technical Representative. The contract will be

presided over by the Defense Supply Center Columbus (DSCC). The PCO is Bruce Patrick of DSCC. The Director of SURVIAC, Mr. Kevin Crosthwaite, and the Booz Allen OIC, Mr. Don Vincent along with the entire SURVIAC Core and Technical Area Task crew want to express their thanks to the community for the support we have received. New technical areas the have been added to the SURVIAC scope with this new contract include Homeland Security and Space Survivability and Vulnerability. We now look forward to working in the future in these vital technical areas. Operations will continue from the current SURVIAC core at Wright-Patterson Air Force Base as well as the satellite offices in Washington, DC and Aberdeen Maryland.

For more information on SURVIAC and its capabilities, please contact Mr. Kevin Crosthwaite, (937) 255-3828, x279, E-mail: [crosthwaite\\_kevin@bah.com](mailto:crosthwaite_kevin@bah.com)

# SURVIAC Product Availability

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## Products

Product	Classification	Reproduction & Handling Fee
A Critical Review of Graphite Epoxy Laser Damage Studies	SECRET	\$ 50.00
A Summary of Aerospace Vehicle Computerized Geometric Descriptions for Vulnerability Analyses	Unclassified	\$100.00 (Free to Gov't)
Advanced Materials for Enhanced Survivability	SECRET	\$100.00
Aircraft Fuel System Fire and Explosion Suppression Design Guide	Unclassified	\$150.00/3 Volumes
'Aircraft Survivability' Video	Unclassified	\$ 50.00 or 30-Day Loan
Alternatives For Halon 1301 In Army Ground Vehicle Firefighting Systems	Unclassified	\$250.00
An Overview of Laser-Induced Eye Effects	SECRET	\$150.00
An Overview of Laser Technology and Applications	Unclassified	\$ 50.00
'Battle Damage Repair of Composite Structures' Video	Unclassified	\$ 75.00
Collection of Vulnerability Test Results for Typical Aircraft Systems and Components	CONFIDENTIAL	\$150.00
Comparative Close Air Support Vulnerability Assessment Study - Executive Summary	SECRET	None (Gov't. Only)
Compendium of References for Nonnuclear Aircraft Survivability (A Supplement to MIL-HDBK-336)	Unclassified	\$150.00
Component Vulnerability Analysis Archive (CVAA) and Workshop Notes	Unclassified	\$300.00 (Free to Gov't)
Component Vulnerability (Pd/h) Workshop Component Pd/h Handbook w/addendum	SECRET	\$200.00 (Free to Gov't)
Component Vulnerability Database Development - CD	SECRET	\$100.00 (Free to Gov't)
Countermeasures Handbook for Aircraft Survivability (3 Volumes)	SECRET	\$200.00 (Free to Gov't)
Critical Review and Technology Assessment (CRTA) for Soldier Survivability (SSv)	Unclassified	\$ 50.00
'Designing for Survivability' Video	Unclassified	30-Day Loan
Directed Energy Effectiveness Modeling State-of-the-Art Report (SOAR)	Unclassified	\$ 50.00
Gas Explosion Suppression Agent Investigation	Unclassified	\$200.00
Gun and Missile Pedigree Threat Reports - CD	SECRET	\$150.00
Joint Live Fire/Live Fire Test Program Catalogue, Version 3.1	Unclassified	\$ 95.00
MANPADS Threat to Aircraft: A Vulnerability Perspective - Final Report	SECRET	\$200.00
Model User Group Meeting Minutes - CD	Unclassified	\$ 50.00
Munition Response State-of-the-Art Report (SOAR)	Unclassified	\$ 50.00
National MANPADS Workshop: A Vulnerability Perspective Proceedings 2 Volumes	SECRET	\$200.00
Penetration Characteristics of Advanced Engine Materials	Unclassified	\$100.00
Proceedings of the Eighth DOD Conference on DEW Vulnerability, Survivability and Effects - 2 Volumes	SECRET	\$125.00/Per Set
RADGUNS 1.8 Parametric Study	SECRET	\$100.00 (Free to Gov't)
Ship Survivability Overview	Unclassified	\$ 50.00
'SURVIAC - A Capabilities Overview' Video	Unclassified	30-Day Loan
Survivability Analysis Workshop Notebook - 2000	Unclassified	\$100.00 (Free to Gov't)
Survivability Systems Master Plan	Unclassified	\$ 50.00 (Free to Gov't)
Testing of Aircraft or Aircraft Surrogates with On-Board Munitions	Unclassified	\$100.00
"Threat Effects in Aircraft Combat Survivability" Video	Unclassified	\$150.00 or 60-Day Loan
Threat Warheads and Effects/Battle Damage Assessment and Repair Archival and Retrieval (TWE/BDAR) System	Unclassified	\$300.00
Ullage Explosion Hazard State-of-the-Art Report (SOAR)	Unclassified	\$200.00
Unmanned Aerial Vehicles Survivability Compendium—Interim Report Database	Unclassified	\$200.00
U.S. Air Force Surface-To-Air Engagements During Operation Desert Storm	SECRET	\$100.00 (Free to Gov't)
Vulnerability Reduction Design Guide for Ground Systems in a Conventional Combat Environment	Unclassified	\$200.00



For further information on how to obtain these products and how to establish need-to-know certification, please contact SURVIAC at (937) 255-4840 or DSN 785-4840. Requests from non-U.S. agencies must be forwarded to their country's Embassy in Washington DC, Attn: Air Attache's Office.

# SURVIAC Model Availability

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Model	Classification	Reproduction & Handling Fee	
		Model	Documentation
AIRADE 7.4—Airborne Radar Detection Model	SECRET	\$500.00	\$ 36.00
ALARM 4.4.1—Advanced Low Altitude Radar Model (Includes EARCE 2.4)	Unclassified	\$500.00	\$ 50.50 <sup>+</sup>
BLUEMAX IV—Variable Airspeed Flight Path Generator	Unclassified	\$500.00	\$ 15.00 <sup>+</sup>
BRAWLER 6.4—Air-To-Air Combat Simulation	SECRET	\$500.00	\$231.50 <sup>+</sup>
*BRL-CAD 6—Ballistic Research Laboratory Computer-Aided Design Package	Unclassified	\$500.00	N/A
***COVART 4.3—Computation of Vulnerable Area and Repair Time	Unclassified	\$500.00	\$ 37.00 <sup>+</sup>
DIME 2.1—Digital Integrated Modeling Environment	Unclassified	\$500.00	\$ 63.00
ESAMS 3.0—Enhanced Surface-To-Air Missile Simulation	SECRET	\$500.00	\$295.50 <sup>+</sup>
***FASTGEN 4.7—Fast Shotline Generator	Unclassified	\$500.00	\$ 52.00 <sup>+</sup>
FATEPEN 3.0.0—Fast Air Target Encounter Penetration Program	Unclassified	\$500.00	TBA <sup>+</sup>
IVIEW 2000—Graphical User Interface for Output Simulation	Unclassified	\$100.00	+
JSEM - Joint Service Endgame Model	Unclassified	\$500.00	TBA <sup>**</sup>
LELAWS 3.0—Low Energy Laser Weapons Simulation	Unclassified	\$500.00	\$ 31.50
MIL-AASPEM 5.1 — Man-in-the-Loop Air-To-Air System Performance Evaluation Model	Unclassified	\$500.00	\$ 80.00 <sup>+</sup>
RADGUNS 2.3—Radar-Directed Gun System Simulation	SECRET	\$500.00	\$ 59.50 <sup>+</sup>
TRAP 3.1a—Trajectory Analysis Program	Unclassified	\$500.00	\$256.00
TRACES3.0.4—Terrain/Rotorcraft Air Combat Evaluation Simulation	Unclassified	\$500.00	\$127.00 <sup>+</sup>

\* For more information regarding BRL-CAD documentation contact Mr. Dwayne Kregel at the SURVIAC Aberdeen Satellite, Office, (410) 273-7722.

\*\* For more information regarding JSEM documentation contact Mr. John Manion at the SURVIAC Aberdeen Satellite, Office, (410) 273-7722.

\*\*\* Model is now part of the Vulnerability Tool Kit

+ Documentation included with code on CD version of Model at no charge



For further information on how to obtain these models and how to establish need-to-know certification, please contact SURVIAC at (937) 255-4840 or DSN 785-4840. Requests from non-U.S. agencies must be forwarded to their country's Embassy in Washington DC, Attn: Air Attache's Office.

Models



## Component Vulnerability Analysis Archive (CVAA) Users Group Meeting to Be Held

The SURVIAC, in conjunction with the Joint Aircraft Survivability Program Office, JASPO, and the Joint Technical Coordinating Group for Munitions Effectiveness, JTTCG/ME, would like to announce the impending availability of a new version of the Component Vulnerability Analysis Archive (CVAA). The CVAA is a searchable database of engineering methodologies, results of completed analyses, and supporting test data to determine the vulnerability of components to a wide variety of damage mechanisms. The CVAA contains vulnerability data on components from systems ranging from aircraft and lightly armored vehicles to hardened targets and ships. Damage mechanisms include penetration, blast, fire, and shock among others. All data in the CVAA has been reviewed by a group of senior vulnerability analysts to ensure traceability to the original source of information and to clearly define limitations of data.

The CVAA has been incorporated into SURVIAC and a users meeting will be held to demonstrate CVAA capabilities, typical usages, and procedures for adding data as well as a "hands on" session to perform data searches and develop local archives. In addition, a discussion of desired CVAA data additions, and avail-

able data/analyses techniques will be held. The workshop will be held at the Booz Allen Hamilton Dayton, Ohio facility. The Users Group Meeting will be held 16 June 2003. Participants in the workshop will receive a CD ROM with CVAA version 5.2 and copies of all presentations given at the workshop. A fee of \$50 to cover administrative fees and generation of the notebook and of the CD ROM will be collected and a receipt will be provided for reimbursement. In order to effectively conduct the "hands on" portion of the workshop, participation will be limited to 25 people. Slots will be allocated on a first come first served basis.

If you have questions regarding the CVAA Users Group Meeting, or have data for inclusion or topics you would like covered, please contact:

*Mr. James Davis*

*COM: (937) 255-3828 x278*

*DSN: 785-4840 x278*

*FAX (937) 255-9673*

*E-mail: davis\_jim@bah.com*



**The Joint Technical Coordinating Group on Aircraft Survivability (JTTCG/AS)  
is now the**

**Joint Aircraft Survivability Program (JASP)**

**The JTTCG/AS Central Office is now JASPO**

**Watch for more information in the next issue of the SURVIAC Bulletin**

## April 2003

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### US Army Ground Vehicle Survivability Symposium

7-10 April 2003

Monterey, California

POC: Lisa Lynch, (586) 978-3108, E-mail: lynch\_lisa@bah.com

### AAAA Annual Convention The Army Aviation Branch

9-12 April 2003

Ft. Worth, Texas

POC: AAAA, 203-268-2450 x131

### Sea-Air-Space 2003 Exposition

15-17 April 2003

Washington, DC

POC: Navy League of US, (800) 356-5760 or (703) 528-1775, [www.navyleague.org](http://www.navyleague.org)

### 13th Fiesta Crow Technical Symposium "Full Spectrum Operations for Future Conflicts and Homeland Defense"

20-23 April 2003

San Antonio, Texas

POC: AOC, (703) 549-1600 or (888) OLD-CROW, [www.crows.org](http://www.crows.org)

## May 2003

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### AFCEA Technet International 2003

6-8 May 2003

Washington, DC

POC: AFCEA, (703) 631-6125, E-mail: [events@afcea.org](mailto:events@afcea.org), [www.technet2003.org](http://www.technet2003.org)

### National Aeronautical Systems & Technology Conference & Exhibition

13-15 May 2003

Dayton, Ohio

POC: NDIA, Naomi Mundy, (703) 247-9476, E-mail: [nmundy@ndia.org](mailto:nmundy@ndia.org), [www.nastc2003.org](http://www.nastc2003.org)

### EO/IR Conference

14-15 May 2003

Adelphi, Maryland

POC: AOC, (703) 549-1600 or (888) OLD-CROW, [www.crows.org](http://www.crows.org)

## June 2003

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### 71st MORS Symposium

10-12 June 2003

Quantico, Virginia

POC: MORS, (703) 933-9070, [www.mors.org](http://www.mors.org)

### Special Forces Expo (Event #3890)

June 24-27

Fayetteville, North Carolina

POC: Kira Delaney, (703) 247-2590, E-mail: [kdelaney@ndia.org](mailto:kdelaney@ndia.org)

## July 2003

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### AIAA/ICAS International Air and Space Symposium and Exposition: The Next 100 Years

14-17 July 2003

Dayton, Ohio

POC: AIAA, (703) 264-7500 or (800) 639-AIAA, E-mail: [custserv@aiaa.org](mailto:custserv@aiaa.org), [www.aiaa.org](http://www.aiaa.org)

### UAVSI 2003 30th Annual Symp/Expo

15-17 July 2003

Baltimore, Maryland

POC: [www.auvsi.org](http://www.auvsi.org)

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